

VIRGINIA READY-MIXED
CONCRETE ASSOCIATION

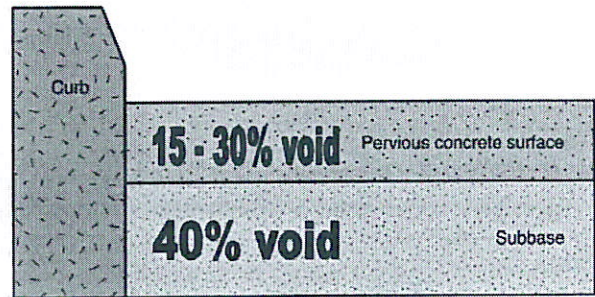
Frequently Asked Questions About

Pervious Concrete



What is Pervious Concrete? In simplest terms, Pervious Concrete is a mix of coarse aggregate, cement, water, and little to no sand. The addition of certain chemical admixtures can enhance the properties of the Pervious Concrete mix and assist in placement. Also known as “no-fines” concrete, this mixture creates an open-cell structure allowing water to filter through to the underlying soil.

How does Pervious Concrete work? Pervious concrete pavement is a permeable pavement surface, typically with an underlying stone reservoir, that temporarily stores surface runoff before it infiltrates into the subsoil. As such, a pervious concrete pavement is an intricate part of a designed storm water management system. By capturing rainwater and allowing it to seep into the ground, Pervious Concrete is instrumental in recharging groundwater, reducing stormwater runoff, and meeting U.S. Environmental Protection Agency (EPA) stormwater regulations. In fact, the use of Pervious Concrete is among the Best Management Practices (BMP's) recommended by the EPA for the management of stormwater runoff.



How is the Pervious Concrete infiltration system designed? When designing Pervious Concrete stormwater management systems, two conditions must be considered: permeability and storage capacity. Excess surface runoff must be prevented. In determining the necessary storage capacity of the infiltration system, the total volume of rain and the infiltration rate of the soil must be considered. The NRMCA, in conjunction with the Portland Cement Association, has developed a Pervious Concrete Hydrological Design guide to assist the design professional.

What if I have poorly draining soil? Typically if a soil has sufficient percolation to support a septic tank system, it will be allowable for pervious concrete. However, if a soil is truly impervious special design considerations that include underground stormwater storage structures can still allow the use of Pervious Concrete to meet detention pond requirements.

Where can Pervious Concrete be used? Pervious Concrete has been used for sidewalks, cart paths, tennis courts, greenhouses, slope protection and pervious base layers under heavy duty pavements. It has also been used in structural applications as foundation walls for single and two-story homes, load-bearing walls for high-rise buildings, sound walls, and sea groins. However, while Pervious Concrete can be used for a surprising number of applications, its primary use is in parking lots.



Why should I use Pervious Concrete? The unique ability of Pervious Concrete to capture stormwater runoff and recharge groundwater can help owners comply with EPA stormwater regulations, while offering the developer significant advantages in maximizing land use. Utilizing Pervious Concrete pavement for parking lots, for example, can minimize or eliminate the need for detention ponds, swales, and other precipitation runoff containment strategies and provide for more efficient land use.



What about clogging? The majority of pervious concrete pavements will function very well with little or no maintenance. However, there may be instances where sand, dirt, leaves and other debris may infiltrate the void structure of the pervious concrete and inhibit its permeability. In most cases, the clogging is limited to the first 1" to 1 ½" of the pavement thickness. Periodic inspection of the pavement's porosity and rate of water percolation, and cleaning as needed, will help maintain the pavement/storm water system to ensure it will remain functional as designed.



What about Freeze/Thaw? Experience has shown that pervious concrete pavements in cold weather climates tend to have an inherent ability to withstand freeze-thaw cycles. Freeze-thaw resistance of pervious concrete appears to depend on the saturation level of the voids in the concrete at the time of freezing. Field observations have shown that the rapid draining characteristics of pervious concrete prevent saturation from occurring.

What about de-icing? The void structure of pervious concrete pavement facilitates a faster thawing of ice and snow on the pavement surface compared with impervious pavements at temperatures modestly below freezing. Therefore, deicing chemicals and anti-skid materials are rarely needed and, as such, are not recommended for pervious concrete pavements. However, if necessary, deicing chemicals and anti-skid materials can be used sparingly. In particular, deicing chemicals should never be applied to concrete that is less than one year old. Anecdotal evidence also suggests that snow covered pervious concrete clears quicker, possibly because its voids allow the snow to melt more quickly than it would on conventional pavements. Mechanical removal of ice and snow can be accomplished using snow blowers or snow plows. Because of its rigid nature, pervious concrete pavement is actually less susceptible than other flexible paving materials to damage from snow plowing.

How is Pervious Concrete placed? A variety of placement techniques including fixed-form or slip-form can be used for constructing pervious concrete pavements. As with conventional concrete, placement techniques are developed to fit the specific jobsite conditions. Normal floating and troweling operations are not used for finishing Pervious Concrete. Rather, the surface is consolidated by light compaction. This consolidation is accomplished by rolling over the concrete with a steel roller.



Who can place Pervious Concrete? Though pervious concrete is not rocket science, it does differ from conventional concrete in many ways. The National Ready Mixed Concrete Association (NRMCA) has developed a Pervious Concrete Contractor Certification program that instructs contractors on the properties of pervious concrete and the proper installation techniques. Many of the specifications being written currently require NRMCA Pervious Concrete Contractor Certification as a prerequisite.

Can Pervious Concrete be colored? Pervious Concrete can be colored at the owner's discretion by using integral color pigments and following standard industry guidelines for colored conventional concrete.

Where can I get Pervious Concrete? Pervious Concrete is available from your local Ready Mixed Concrete Producer.

Where can I get more information on Pervious Concrete? There are many resources for in-depth information on pervious concrete, but perhaps the resource is your state or local ready mixed concrete association. Contact them for more assistance on identifying existing local projects, assistance with the approval/permitting process, and to become a certified pervious concrete contractor. Additionally, you can find more information at www.PerviousPavement.org.

Benefits of Using Pervious Concrete

Reduced Stormwater Runoff - Pervious Concrete captures the first flush of rainfall, minimizing total runoff.

Improved Water Quality - Pervious Concrete percolates stormwater into the soil to replenish the aquifer, while its open-cell structure provides a medium for aerobic bacteria that break down many of the pollutants that seep from parked cars.

Reduced Heat Island Effect - Due to its lighter color, Pervious Concrete pavement can reduce ambient air temperatures by as much as 7 to 10 degrees, thus reducing ground level ozone production by as much as 30%.

Cost Savings - Pervious Concrete infiltration systems can save hundreds of thousands of dollars in construction costs by eliminating detention ponds and costly under drain components. And because of its low maintenance demands, concrete pavement, conventional or pervious, is widely recognized as the lowest life cycle cost option available for paving.

Maximized Land Use Efficiency - By eliminating detention ponds through the use of Pervious Concrete, land ordinarily devoted to costly stormwater management practices can be developed or preserved

Durability - A properly designed and constructed Pervious Concrete parking lot will last 20 to 40 years with little maintenance.

Supports Sustainable Development - Incorporating Pervious Concrete into building plans can contribute 3 to 5 points toward achieving US Green Building Council's "Leadership in Energy and Environmental Design" (LEED) certification

Pervious Concrete is the Best Choice for Stormwater Management

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